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ABSTRACT

A survey of 524 planning agencies and consultants in the Midwest and Southwest was undertaken in 1976 to identify skills required for planning and to assess current capabilities in those skill areas. The major purpose of the survey was to aid geographic educators as they prepare students for careers in the planning profession. One part of the survey identified the major planning functions of the 524 respondents. These functions emphasized community development, housing, transportation, capital improvements, zoning, land use, preparing federal and state applications, and general planning research. In another part of the survey, respondents were asked to rate 70 different skills for their importance to the operation of their organizations. Skills ranked essential by more than 40% of the respondents included the abilities to write clear and concise reports, work effectively with other professionals, present technical issues to public officials and to citizens' groups, develop land-use maps, and assist in environmental impact assessment. To develop skills in these areas, geography educators should provide training in mapping and graphics, secondary data recovery, communications, primary data generation, quantitative methods, and interpretation of legal processes as they apply to planning. (DB)

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GEOGRAPHERS AS PLANNERS: WHAT SKILLS DOES THE JOB REQUIRE[1]

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Geographers in increasing numbers are filling positions in the field of planning. It seems appropriate that geographic educators ought to explore the question of improving the preparedness of students aspiring to careers in the planning profession. Such a query seems timely as many geographic educators have little formal experience in the planning field.

During 1976 a national survey of planning organizations was conducted as a part of a project funded by NSF. The objective of this survey was twofold. First, to identify the skills utilized in the day to day work of planning organizations. Secondly, to assess planning organizations' current capabilities in these skill areas. This paper reports some of the survey's findings.

The Survey Instrument

Ideas from practitioners and educators in the fields of planning public works, civil engineering and geography were used to develop a survey instrument. The instrument was pretested on a randomly selected sample of fifty planning agencies and consultants in northeastern Ohio and western Pennsylvania. The result of the pretest were reviewed by the project's steering committee, some twenty practitioners and

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educators from the previously identified fields. Their suggestions were incorporated in the finalized instrument. The completed document was then reviewed by several persons from the field of opinion research. The instrument contained thirty-three questions relating to the nature of the responding organization, an assessment of seventy different skills, queries concerning the potential for jobs and the characteristics of the person completing the instrument.

Sample Design

Two strategies were employed in designing a sample for the survey. The first was to identify a nationally representative population and secondly, four specific regional target areas were defined. One task of the survey was to assess national needs for specific skills. After a thorough investigation and review, it was decided that the most representative national group would be regional councils. These organizations are A-95 clearinghouses in the application process for Federal funding. As such, they are responsible for making recommendations on most major expenditures for planning and public works projects in the country. Moreover, most councils have specific planning functions that are related to comprehensive planning and intergrating capital improvement programs.

The 1975 membership list of the National Association of Regional Councils was used to delineate the population

for sampling. In that year a total of 664 councils held membership in the association. Of these, one half, 332, were randomly selected and surveyed. The return rate for this group, forty-nine percent, was exceptional.

In addition, four regional target areas were selected because institutions and individuals participating in the project had expressed an interest in the needs of their immediate area. The target regions selected were central Arizona, southeast Nebraska, east central Wisconsin and northeast Ohio-western Pennsylvania. The areal extent of these regions are shown in Figure 1. Agencies and organizations within these areas were identified by use of state and local governmental directories and membership rosters of professional organizations. A total of 524 organizations were identified and surveyed. The return rate for this group was twenty percent, a figure consistent with the normally expected returns of a mail survey.

Data Analysis

In the short time available it would be impossible to discuss an analysis of all the data. Therefore, I shall highlight what I consider to be the more important findings by identifying some characteristics of the respondents, their perceptions of the skills required for planning and their current capabilities in these skill areas.

The respondents planning functions tended to center on community development, housing, transportation, capital

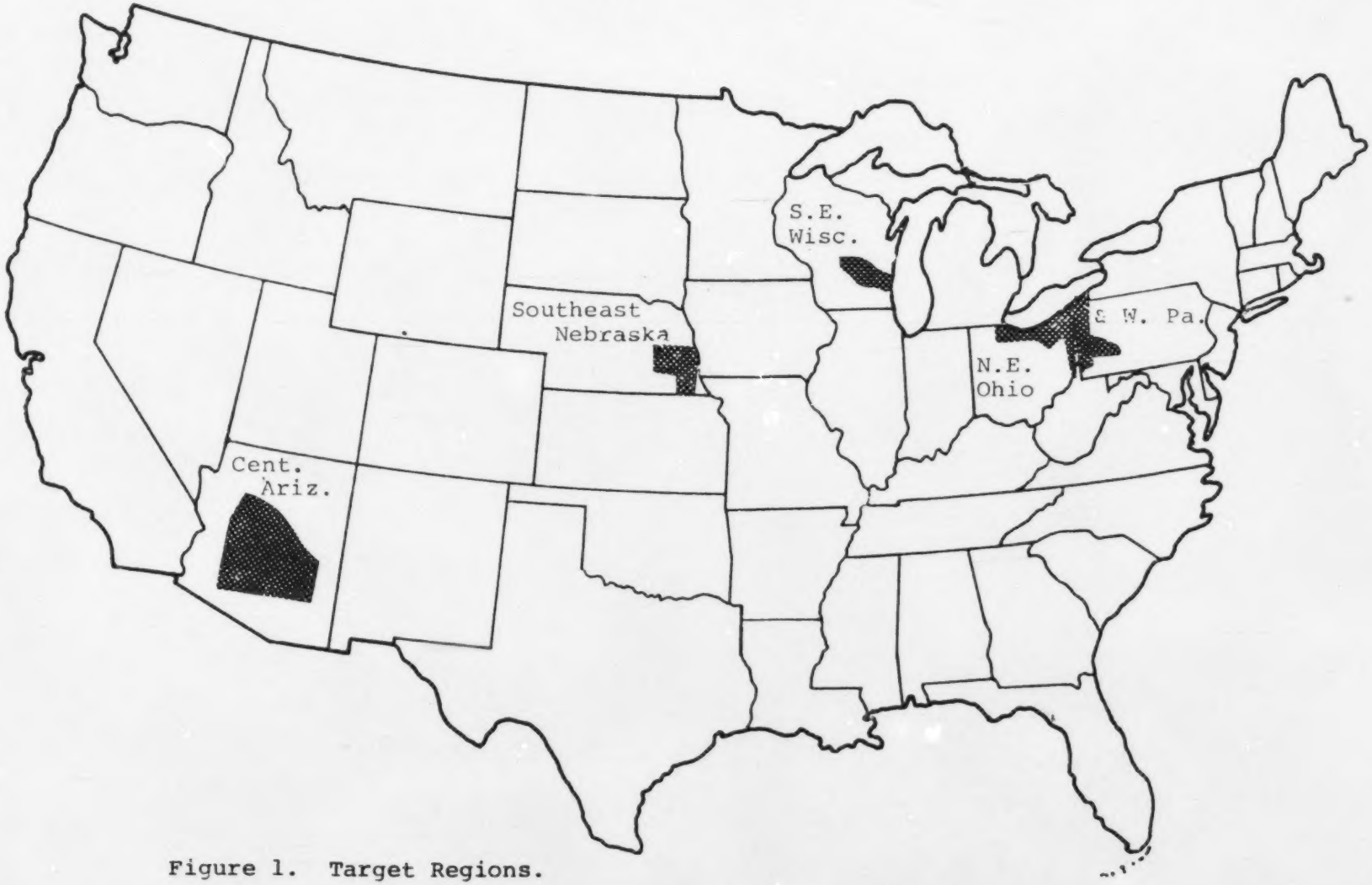

Figure 1. Target Regions.

improvements, 701 planning, zoning, land use and general research. Probably more significant is the amount of time spent on specific work functions. Six functions appear to be the most important to the respondents. These are developing preliminary design concepts, preparation of federal and state applications, program development and analysis, data processing and information system development, updating maps, and reviewing projects. These functions should be good indicators of the types of skills planners need.

But specifically, what skills are needed? The questionnaire asked respondents to rate the importance of seventy different skills to the operation of their organization. Respondents rated skills on a scale from one to five where a value of one was a skill essential to their operation, a value of three, a valuable skill, and five indicated the skill was not important. Tables 1 and 2 provide information on the skill needs of responding organizations. Table 1 is a ranking of all the skills in the survey based on the cumulative frequency of respondents giving a skill a value of one, two or three, while Table 2 indicates the percent of respondents that rated a skill essential. In the interest of brevity only those skills ranked essential by more than forty percent of the respondents are listed.

TABLE 1

Rank of Skills by Importance to the Operation of All Responding Organizations

Rank	Skill	Percent of Organizations Ranking Skill Essential to Desirable
1	Write a clear and concise report	98.2
1	Work effectively with professionals of other agencies and departments	98.2
3	Work effectively with citizen's groups	97.5
4	Find and understand information in government documents	97.2
5	Speak effectively to a professional group	96.8
5	Speak effectively to a citizen's group	96.8
7	Present a technical issue to public officials	96.6
8	Read a topographic map	94.0
9	Perform graphic design, color code maps and charts	92.3
10	Assist in an environmental impact analysis	91.8
11	Research zoning and subdivision regulations without assistance	91.1
12	Conduct a formal telephone or personal interview	90.7
13	Conduct a land use capability analysis	87.9
14	Possess a working knowledge of census data and other pertinent informational resources	87.7
15	Analyze the results of a questionnaire or opinion survey	87.1

TABLE 1 (cont'd)

15	Work effectively with racial minorities	87.1
17	Develop a land use map	86.6
18	Organize an interagency task force	84.7
19	Assist in a cost-effectiveness analysis	83.3
20	Research without assistance a problem in planning law	82.9
21	Do line drawings	82.8
22	Prepare a population projection	82.7
23	Read a blueprint	82.1
24	Develop a land capability map	82.0
25	Analyze alternative recommendations for changes in state and local laws	81.6
26	Interpret air photos of land use	81.3
27	Collect data for an economic base study	81.1
28	Understand alighment, profiles and cross sections	79.6
29	Draw a representative sample of a known population	77.8
30	Use a programmable desk calculator	77.4
31	Do basic cost accounting	77.3
32	Interpret a building code	77.1
33	Conduct a critical path analysis of a scheduling problem	76.7
34	Use a typewriter	72.8
35	Scribe a map	72.7
35	Make use of a simulation model for transportation or land use planning	72.7
37	Analyze traffic count data	72.1
38	Calculate measures of central tendency	71.7
39	Assist in a right-of-way analysis	70.8

TABLE 1 (cont'd)

39	Perform algebraic or trigonometric computations	70.8
41	Interpret a cross tabulation of two variables	70.6
42	Do a network analysis of a transportation problem	68.8
43	Understand survey notes and terminology	66.9
44	Prepare a cost estimate analysis for a public works project	64.8
45	Calculate a correlation coefficient	64.5
46	Conduct an on-site zoning inspection	60.9
47	Calculate a linear regression	60.6
48	Take a traffic count	59.2
49	Tabulate and analyze project bid proposals	58.6
50	Interpret a linear regression equation	57.7
51	Lay out a sewer plan	57.3
52	Interpret partial and multiple correlation coefficients	55.4
52	Use a geocoding system	55.4
54	Interpret the results of a factor analysis	55.3
55	Calculate sewer flows	51.4
56	Do general computer programming	50.9
56	Be familiar with the properties of various construction materials	50.9
58	Measure hydrologic flows	49.8
59	Do plane table mapping	47.4
60	Interpret remote images	44.9
61	Perform an elementary time and motion study	41.6
62	Use surveying instruments to lay out a site	39.9

TABLE 1 (cont'd)

63	Take a soil sample	37.9
64	Interpret correlation coefficients and statistical significance	34.9
65	Take and analyze a water sample	34.6
66	Build a three-dimensional structural model	33.1
67	Analyze a soil sample	32.7
68	Conduct a fire safety inspection of a house or building	28.6
69	Use computer statistical packages	28.5
70	Use computer graphic software packages	23.0

TABLE 2

Skills Most Frequently Identified as Essential by Respondents

Rank	Skill	Percent of Respondents Identifying as Essential
1	Write a clear and concise report	83.8
2	Work effectively with professionals in other agencies and departments	75.4
3	Present a technical issue to a public official	73.0
4	Speak effectively to a citizen's group	72.3
5	Work effectively with a citizen's group	70.8
6	Speak effectively to a professional group	62.7
7	Find and understand information in government documents	60.9
8	Develop a land use map	58.1
9	Possess a working knowledge of census data and other pertinent informational resources	57.1
10	Read a topographic map	56.5
11	Research zoning and subdivision regulations without assistance	55.0
12	Perform graphic design, color coding of maps and charts	51.7
13	Work effectively with racial minorities	48.9
14	Read a blueprint	46.7
15	Conduct a formal phone or personal interview	46.3
16	Develop a land capability map	45.2
17	Do line drawings	44.6
18	Assist in an environmental impact assessment	42.7

From these lists eighteen skills essential to the daily operation of the respondents were identified. These skills, called primary skills, are shown in Table 3.

TABLE 3

Primary Skills

Write a clear and concise report
Work effectively with professionals in other agencies and departments
Present a technical issue to public officials
Speak effectively to a citizen's group
Work effectively with a citizen's group
Speak effectively to a professional group
Find and understand information in government documents
Develop a land use map
Possess a working knowledge of census data and other pertinent informational resources
Read a topographic map
Research zoning and subdivision regulations without assistance
Perform graphic design, color coding of maps and charts
Work effectively with racial minorities
Read a blueprint
Conduct a formal phone or personal interview
Develop a land capability map
Do line drawings
Assist in an environmental impact assessment

To qualify for the list, a skill must have been rated essential (a value of one) by forty percent of the respondents and at least eighty percent had to have ranked it in the essential to desirable category. It is instructive to examine this list. More than half are generally included in the training of undergraduate geography majors. Others involve communication and interpersonal relationships. This list offers some clues on how geographers wanting to enter the planning field should be trained. First, it points

to the need for an ability to collect data from a variety of sources. Second, it underscores the need for effective communication and dissimulation of that data to a wide variety of audiences.

The above process served to identify those skills that are required in the day to day operation of the respondents. However, it is important in an educational program to assess what future needs may be. Respondents were also queried as to these current capabilities for each of the seventy skills. The purpose of this question was to elicit information concerning skills that were in short supply. When coupled with the question concerning desirability, it becomes possible to compute an index of need. A respondent's need index was developed to identify those skills that respondents considered important and that were in short supply in their agency. The formula for the index is:

$$I = R - 5(C)$$

Where:

I = the need index value

R = the median value of the importance of a skill on a scale of one to five, where one is essential and five is not important.

C = the median value of respondents' current capability measured on a scale of one to three where one equals adequate and three equals none.

The needs index has a maximum possible value of 12 and a minimum of 0. Values were computed for all seventy skills and are shown below in Table 4.

TABLE 4

Needs Index

Rank	Skill	Index Value
1	Conduct a land use capability study	4.48
2.5	Possess a working knowledge of census data and other pertinent informational resources	4.32
2.5	Research zoning and subdivision regulations without assistance	4.32
4.5	Develop a land capability map	4.29
4.5	Write a clear and concise report	4.29
7	Perform graphic design, color coding of maps and charts	4.20
7	Work effectively with racial minorities	4.20
7	Assist in an environmental impact statement	4.20
10.5	Present a technical issue to public officials	4.18
10.5	Speak effectively to a citizens' group	4.18
10.5	Work effectively with a citizens' group	4.18
10.5	Make use of a simulation model for transportation and land use planning	4.18
13	Assist in a cost-effectiveness analysis	4.08
15.5	Read a topographic map	4.07
15.5	Develop a land use map	4.07
15.5	Speak effectively to a professional group	4.07
15.5	Find and understand information in government documents	4.07
18.5	Collect data for an economic base study	4.06
18.5	Prepare a population projection	4.06
20	Analyze alternative recommendations for changes in state and local laws	3.92
21	Conduct a critical path analysis of a scheduling problem	3.91
22	Analyze the results of a questionnaire or opinion survey	3.84
23	Work effectively with professionals from other departments and agencies	3.80
24	Draw a representative sample from a known population	3.78
25.5	Research without assistance a problem in planning law	3.78
25.5	Do a network analysis of a transportation problem	3.78

TABLE 4 cont'd...

Rank	Skill	Index Value
27	Analyze traffic count data	3.75
28.5	Read a blueprint	3.63
28.5	Conduct a formal telephone or personal interview	3.63
31	Interpret a building code	3.60
31	Do general programming	3.60
31	Organize an interagency task force	3.60
33	Assist in a right-of-way analysis	3.57
34	Do line drawings	3.52
35.5	Prepare a cost estimate of a public works project	3.52
35.5	Use computer statistical package	3.52
38	Conduct an on-site zoning inspection	3.45
38	Calculate measures of central tendency and statistical distributions	3.45
38	Do basic cost accounting	3.45
40	Lay out a sewer plan	3.42
41.5	Use a geocoding system	3.40
41.5	Interpret correlatin coefficients and statistical significance	3.40
43	Understand alignment, profiles, and cross sections	3.38
44.5	Scribe a map	3.36
44.5	Understand survey notes and terminology	3.36
46	Use a computer graphics software package	3.30
47.5	Use a programmable desk calculator	3.25
47.5	Interpret airphotos of land use	3.25
50	Calculate a linear regression	3.23
50	Interpret a linear regression equation	3.23
50	Interpret partial and multiple correlation coefficients	3.23
52	Calculate a correlation coefficient	3.20
53	Be familiar with the properties of various construction materials	3.15
54	Perform algebraic and trigonometric computations	3.12
55	Interpret a cross tabulation of two variables	3.08
56	Interpret the results of a factor analysis	3.06
57	Measure hydrologic flows	3.00
58	Use a typewriter	2.97
59	Calculate sewer flows	2.88
60	Interpret remote images	2.86
61.5	Take a traffic count	2.85
61.5	Tabulate and analyze project bid proposals	2.85
63	Perform an elementary time and motion study	2.64
64	Do plane table mapping	2.52
65	Take a soil sample	2.40
66	Use survey instruments to lay out a site	1.90
67	Analyze a soil sample	1.82
68	Take and analyze a water sample	1.82
69	Build a three dimensional structural model	1.61
70	Conduct a fire safety inspection of a house or building	1.25

The index tends to strengthen the findings arising from the examination of the importance of the skills. However, some of the more elementary skills, reading a blueprint and doing line drawings, drop out of the list. Also, complicated tasks loom more important--namely, conducting a land capability study, using transportation simulation models and cost effective analysis. This suggests that in training geographers to be planners we need to go a bit beyond the rudimentary skills of collecting and presenting data.

CURRICULAR COMPONENTS

Having identified skills that are currently needed and some that may be needed in the future, it remains to develop a curriculum to equip students with these skills. Six specific areas germane to geographic education have been identified. The six and their educational objectives are:

MAPPING AND GRAPHICS

Objective: Acquire competency in the use of mapping instruments, techniques and mediums.

Applications: Be able to produce the line drawings, graphs, and maps employed by planning agencies. Specifically, be able to produce isoline, choropleth and thematic maps.

Skills: Do line drawings
Scribe a map
Read a topographic map
Develop a land capability map
Read a blueprint
Perform graphic design, color coding of maps and charts

SECONDARY DATA RECOVERY

Objective: Locate, retrieve and interpret information from published data sources.

Applications: Become familiar with the basic library tools used by planning and public works agencies. Particular emphasis should be placed on use of census data, the publications of federal departments and agencies, state departments and agencies, as well as, local sources. The basic reference tools of planning and related fields should be explored along with the various sources of maps and data on the physical environment. Non-governmental data sources should also be examined.

Skills: Possess a working knowledge of census data and other pertinent informational resources
Find and understand information in government documents

COMMUNICATIONS

Objective: Communicate and empathize with both professionals and nonprofessionals.

Applications: Conduct meeting, work with citizens and present issues in both written and oral form.

Skills: Speak effectively to a citizens' group
Work effectively with citizens' group
Work effectively with racial minorities
Write a clear and concise report
Speak effectively to a professional group
Present a technical issue to elected officials
Organize an interagency task force
Work effectively with professionals of other agencies and departments

PRIMARY DATA GENERATION AND INTERPRETATION

Objective: To develop competencies in the collection and interpretation of non-published data commonly employed by planning agencies.

Applications: Collect and interpret data for the following types of studies: land use, land capability, traffic flows and origins and destinations. In addition, they should be able to apply the techniques of sampling and interviewing to urban related problems.

Skills:
- Collect data for an economic base study
- Draw a representative sample from a known population
- Conduct a formal telephone or personal interview
- Conduct a land use capability analysis

LEGAL CONTROLS

Objective: Develop an understanding of the legal processes at the federal, state and local level as they apply to planning.

Applications: Become familiar with the major legislation regulating and funding planning. Review the tenor of court decisions regarding planning concerns, zoning subdivision and codes.

Skills:
- Analyze alternative recommendations for changes in local or state law
- Find and understand information in government documents
- Research without assistance a problem in planning law
- Research zoning and subdivision regulations without assistance
- Conduct an on-site zoning inspection

QUANTITATIVE METHODS

Objective: Acquire a competency in basic statistical methods.

Application: Utilize statistical measures to summarize and describe data.

Skills: Perform algebraic and trigonometric computations
Calculate measures of central tendencies
Draw a representative sample of a known population
Analyze the results of a questionnaire or opinion survey

Primary Data Generation. Objective: Develop competencies in the collection and interpretation of non-published data.

Legal Controls. Objective: Develop an understanding of the legal processes at the federal, state and local level as it applies to planning.

Quantitative Methods. Objective: Acquire competency in basic statistical methods.

At Youngstown State University we have tried to incorporate these ideas in our curricul --a planning orientation in cartography and field methods, instituted a course on city and regional planning, insisting students take additional course work in written and oral communication and that they participate in an urban intern program. Our experience to date has shown that geographers so trained have little trouble entering the planning profession.